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DRAFT USER PROCEDURES: SOFTWARE WHEAT YIELD PREDICTIONS/FOREIGN EQUIVALENT TEST

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National Aeronautics and Space Administration
LYNDON B. JOHNSON SPACE CENTER
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WHEAT YIELD PREDICTIONS/FOREIGN EQUIVALENT TEST

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DRAFT USER PROCEDURES: SOFTWARE

WHEAT YIELD PREDICTIONS/FOREIGN EQUIVALENT TEST

1. INTRODUCTION

To proceed with regression analyses, the user needs to have all relevant EXEC, control (parameter) and data files on his own disk area. The files necessary are listed in Appendix 1. These files may be punched over from JSC720 A disk. Program TEXT files are also on JSC720. They are not needed on the user's disk area as the EXEC files link the user's A disk to JSC720 A disk. The TEXT files are listed in Appendix 2.

The complete set of files used in the regression analysis comprises 11 EXEC files, 30 control files, 11 data files and 43 FORTRAN programs and subprograms.

The control files set processing parameters for use in program execution, and also contain labels which identify output.

The control files require editing from analysis to analysis. The amount of editing depends on changes of region name, changes of data density type and changes of data sample and prediction years. The control file SCALE DATA enables the user to scale sets of derived data on an individual basis.

The EXEC files assist the user by output at the terminal which outlines their function, user - controllable inputs, and outputs.

The programs include numerous diagnostics of an explicit kind, and, in general, the diagnostics are self explanatory.

Up to nine predictor variables may be used in the regression analysis. Data sets may contain up to 35 observations.

2. EXECUTION OF ANALYSES

Actual execution of an analysis, after editing of control files is completed, is carried out by typing five to eight key words, in sequence. Each key word is the name of an EXEC file. The steps are:

REFORMAT
SPLIT
DISPLAY (optional)
EDIT --
MERGE --
LIST (optional)
SCALE (optional)
ANALYZE

Suffixes used in EXEC names correspond to regional data, e.g. KS: Kansas; NE: Nebrasks; OK: Oklahoma.

3. EXEC FILES

The functions of the EXEC files are outlined below.

Name	Function
REFORMAT	Writes out temperature, precipitation (and other superfluous) data for each region in a standard climatological format.
SPLIT	Divides the climatic data file into high and low density data files.
DISPLAY (optional)	Lists the two files with means.
EDITKSOK EDITNE	Create files of precipitation data required in subsequent data manipulations
MERGEKS MERGEOK MERGENE	Produce files of potential evapotranspiration, and of departure from normal and departure from normal squared, for the sample period to be analyzed.
LIST (optional)	Displays the files of statistics produced under the MERGE step. The user may choose scaling parameters to apply. In this event, the file SCALE DATA must be edited to incorporate them, before typing SCALE.
SCALE (optional)	Scales the MERGE data before input.
ANALYZE	Forms the complete input file for analysis and carries out the multiple regression.

Operations MERGE, LIST, SCALE and ANALYZE are the only ones required after the first fit of a series carried out on a particular set of regional and density data. The first fit commences with REFORMAT.

Each EXEC outputs a succinct statement of its function on the terminal. It also gives the names of the control files required by the programs executing under the EXEC, and the names of the files written to disk.

4. CONTROL FILES

The control files contain output labels, identifying the data, and specify processing options. In general, they consist of:

Record 1. Label record
Record 2. Run parameters record
Record 3. Edit parameters record
Record 4. LAST record.

For any particular regression fit, the specifications in the control files must be consistent with regard to:

Region name - KANSAS, OKLAHOMA, NEBRASKA
Region code - KS, OK, NE
Data density description - HIGH, LOW
Sample - first year, and associated prediction year,
e.g. 1955 1967

Inadvertent inconsistencies will generally cause termination of processing. However, the programs do not check all possible inconsistencies. As the printed output makes the operation of the programs completely transparent to the user, any inconsistencies will be readily apparent.

The control files associated with particular EXECs are listed below. The user will need to refer to this section when editing control files.

EXEC	Control file name	Notes
REFORMAT	None	
SPLIT	None	
DISPLAY	PARAMHI DATA PARAMLO DATA	No user editing is necessary
EDITKSOK	EDITMAR DATA EDITMAY DATA EDITJUN DATA EDITSEAS DATA	User must update: Region name, region code, data density description and density code.
EDITNE	EDITAPR DATA EDITEMP DATA EDITJUN DATA EDITOCT DATA	User must update: Region name, region code, data density description and density code.
MERGEKS MERGEOK	EVAP DATA* DIFF DATA MAR DATA MAY DATA* JUNE DATA* SEASON DATA	User must update: Region name, data density description, density code (EVAP DATA only), first year, and prediction year.
MERGENE	EVAP DATA* RATIO DATA MAY DATA* JUNE DATA* OCTOBER DATA	User must update: Region name, data density description, density code (EVAP DATA only), first year, and prediction year.
LIST	LIST DATA	No user editing is necessary
SCALE	SCALE DATA	User must update: Data density description, density code. User must also define, and if desired, change scaling factors for DFN and DFN squared data. If no scaling parameters are edited in, the data are not changed, and roundoff error may be a problem.
ANALYZE	MULTY DATA	User must update: Region name, data density description, first year and prediction year.

EXEC	Control file name	Notes
		User must also check that the second parameter on record 3, is either 10 or 9 as required by the total number of data sets. In the analyses for Kansas and Oklahoma data, this will be 10; for Nebraska data, 9.

* The parameters of these files are initialized before each group of regional analyses by the use of the COPYFILE instruction, e.g. COPYFILE MAYKS DATA A MAY DATA A (REPLACE .

A complete set of control files is provided in Appendix 3. All integer parameters in control files are in I5 format.

5. EDITING CONTROL FILES

Editing of control files falls into four types. The editing to be carried out in each circumstance is described below. The control files are referred to by EXEC type. The names of the control files are listed in the previous section.

5.1 Change of Region, Data Density and Sample

EXEC type	User Action
EDIT	Change: region name region code HIGH to LOW, or vice versa HI to LO, or vice versa
MERGE	Change: region name region code (EVAP DATA only) HIGH to LOW, or vice versa HI to LO, or vice versa (EVAP DATA only), first year and prediction year
SCALE	COPYFILE appropriate SCALE/KS/OK/NE DATA file as SCALE DATA Change: HIGH to LOW, or vice versa

EXEC type		User Action
ANALYZE	Change:	region name HIGH to LOW, or vice versa first year and prediction year.

5.2 Change of Data Density and Sample

EXEC type		User Action
EDIT	Change:	HIGH to LOW, or vice versa HI to LO, or vice versa
MERGE	Change:	HIGH to LOW, or vice versa HI to LO, or vice versa (EVAP DATA only), first year and prediction year.
SCALE	Change:	HIGH to LOW, or vice versa HI to LO, or vice versa.
ANALYZE	Change:	HIGH to LOW, or vice versa first year and prediction year

5.3 Change of Sample

EXEC type	User Action
EDIT	No editing
MERGE	Change: first year and prediction year
SCALE	No editing
ANALYZE	Change: first year and prediction year

5.4 Change of Scaling Parameters - SCALE DATA

The scaling parameter is the middle integer parameter on the third and subsequent records of the control file, SCALE DATA.

When initialized, i.e. by COPYFILE of SCALEKS DATA, SCALEOK DATA or SCALENE DATA, the scaling parameter is 0. Derived statistics, i.e,

departure from normal DFN, and departure from normal squared DFN2, may be scaled by individual set. In general, DFN2 sets will require scaling by 10^{-2}, 10^{-3} or 10^{-4}. The scaling parameter is set by changing 0 to 1, 2, 3 or 4, corresponding to 10^{-1}, 10^{-2}, 10^{-3}, 10^{-4}. If the scaling parameter is set to 0, there is no operation.

An annotated example of SCALE DATA is given in Appendix 3.

Editing of control files is simply and efficiently carried out by the recursive use of

C/OLD/NEW/⍀*⍀G
TOP

until all changes have been incorporated in the control file.

6. PROCESSING CYCLE - KANSAS DATA

The steps for carrying out a complete production run are given below.

6.1 KANSAS ANALYSIS - PRELIMINARY

6.1.1 COPYFILE KSOA DATA A FILE FT08F001 A (REPLACE RECFM F LRECL 80

6.1.2 REFORMAT (note: any missing annual statistics represented by the missing value code -0.01 may be edited into the file SRCE DATA at the user's discretion. The values to be used are output at the terminal. If missing values are edited in, remove the file identifier for missing values, MV, by using C/MV/⍀⍀/ * G.

6.1.3 SPLIT

6.1.4 DISPLAY (optional)

6.1.5 Check that the number of data sets to be input to regression is defined as 10 on record 3 of MULTY DATA (second parameter)

6.2 KANSAS ANALYSIS - HIGH DENSITY DATA

6.2.1 COPYFILE SRCEHI DATA A SRCE DATA A (REPLACE RECFM F LRECL 80
COPYFILE EVAPKSOK DATA A EVAP DATA A (REPLACE
COPYFILE MAYKS DATA A MAY DATA A (REPLACE
COPYFILE JUNEKS DATA A JUNE DATA A (REPLACE

6.2.2 Edit control files associated with EDITKSOK, MERGEKS, SCALE and ANALYZE EXECs to appropriate labels (see section 4 and section 5.1)

6.2.3 EDITKSOK

6.2.4 MERGEKS
LIST (optional)

6.2.5 Edit SCALE DATA, if necessary, to redefine scaling parameters.

6.2.6 SCALE
ANALYZE (note: if prediction is not written at terminal, run has terminated abnormally. Check FILE FT06F001, or look for diagnostics in output.

6.2.7 Change first and prediction years in control files associated with MERGEKS and ANALYZE EXECS.

6.2.8 Repeat items 6.2.4 through 6.2.7 until fits have been completed.

6.3 KANSAS ANALYSIS - LOW DENSITY DATA

6.3.1 COPYFILE SRCELO DATA A SRCE DATA A (REPLACE RECFM F LRECL 80
If Kansas data have not been analyzed previously,
COPYFILE EVAPKSOK DATA A EVAP DATA A (REPLACE
COPYFILE MAYKS DATA A MAY DATA A (REPLACE
COPYFILE JUNEKS DATA A JUNE DATA A (REPLACE

6.3.2 Complete items 6.2.2 through 6.2.8.

7. PROCESSING CYCLE - OKLAHOMA DATA

7.1 OKLAHOMA ANALYSIS - PRELIMINARY

7.1.1 COPYFILE OKOA DATA A FILE FT08001 A (REPLACE RECFM F LRECL 80

7.1.2 REFORMAT (see 6:1:2)

7.1.3 SPLIT

7.1.4 DISPLAY (optional)

7.1.5 Check that the number of data sets to be input to regression is defined as 10 on record 3 of MULTY DATA

7.2 OKLAHOMA ANALYSIS - HIGH DENSITY DATA

7.2.1 COPYFILE SRCEHI DATA A SRCE DATA A (REPLACE RECFM F LRECL 80
COPYFILE EVAPKSOK DATA A EVAP DATA A (REPLACE
COPYFILE MAYOK DATA A MAY DATA A (REPLACE
COPYFILE JUNEOK DATA A JUNE DATA A (REPLACE

7.2.2 Edit control files associated with EDITKSOK, MERGEOK, SCALE and ANALYZE EXECs to appropriate labels, etc. (See section 4 and section 5)

7.2.3 EDITKSOK

7.2.4 MERGEOK
LIST

7.2.5 Edit SCALE DATA, if necessary, to redefine scaling parameters.

7.2.6 SCALE
ANALYZE (see note for 6.2.6)

7.2.7 Change first and prediction years in control files associated with MERGEOK and ANALYZE EXECs.

7.2.8 Repeat items 7.2.4 through 7.2.7 until fits have been completed.

7.3 OKLAHOMA ANALYSIS - LOW DENSITY DATA

7.3.1 COPYFILE SRCELO DATA A SRCE DATA A (REPLACE RECFM F LRECL 80
If Oklahoma data have not been analyzed previously,
COPYFILE EVAPKSOK DATA A EVAP DATA A (REPLACE
COPYFILE MAYOK DATA A MAY DATA A (REPLACE
COPYFILE JUNEKS DATA A JUNE DATA A (REPLACE

7.3.2 Complete items 7.2.2 through 7.2.8

8. PROCESSING CYCLE - NEBRASKA DATA

8.1.1 COPYFILE NEDA DATA FIL' FT08F001 A (REPLACE RECFM F LRECL 80

8.1.2 REFORMAT

8.1.3 SPLIT

8.1.4 DISPLAY (optional)

8.1.5 Check that the number of data sets to be input to regression is defined as 9 on record 3 of MULTY DATA

8.2 NEBRASKA ANALYSIS - HIGH DENSITY DATA

8.2.1 COPYFILE SRCEHI DATA A SRCE DATA A (REPLACE RECFM F LRECL 80
COPYFILE EVAPNE DATA A EVAP DATA A (REPLACE
COPYFILE MAYNE DATA A MAY DATA A (REPLACE
COPYFILE JUNEB DATA A JUNE DATA A (REPLACE

8.2.2 Edit control files associated with EDITNE, MERGENE, SCALE and ANALYZE EXECs to appropriate labels, etc, (See section 4 and section 5).

8.2.3 EDITNE

8.2.4 MERGENE
LIST

8.2.5 Edit SCALE DATA, if necessary, to redefine scaling parameters.

8.2.6 SCALE
ANALYZE (see note for 6.2.6)

8.2.7 Change first and prediction years in control files associated with MERGENE and ANALYZE EXECs.

8.2.8 Repeat items 8.2.4 through 8.2.7 units fits have been completed.

8.3 NEBRASKA ANALYSIS - LOW DENSITY DATA

8.3.1 COPYFILE SRCELO DATA A SRCE DATA A (REPLACE RECFM F LRECL 80
If Nebraska data have not been analyzed previously,
COPYFILE EVAPNE DATA A EVAP DATA A (REPLACE
COPYFILE MAYNE DATA A MAY DATA A (REPLACE
COPYFILE JUNENE DATA A JUNE DATA A (REPLACE

8.3.2 Complete items 8.2.2 through 8.2.8

8. INTERPRETATION OF OUTPUT

As the development of the file for analysis proceeds, manipulations of the data are tracked by identifiers automatically added to the file labels of the variables. The data files are printed after each step.

The generation of the input data is thus a completely transparent operation. The file identifiers and their meanings are:

OBJ	Objective analysis data
FULL	Record contains no missing values
MV	Missing value (annual statistic - not relevant).
R MM	Precipitation in mm
E MM	Potential evapotranspiration in mm
P-E	Precipitation minus potential evapotranspiration.
P/E	Precipitation divided by potential evapotranspiration.
ADJ	Data modified by constant
C=	Constant used in modifying data
ETD	Sample from complete record
DFN	Departure from normal
DFN2	Departure from normal, squared
DEG DAY	Degree day data
SRCE	Source data
T C	Temperature in degrees celsius
D>32	Days having temperatures >32°C
COMP	Composite file, e.g. difference or ratio of observations on 2 variables
A-F	August to February
MAR	March data
MAY	May data

APR	April data
JUN	June data
OCT	October data
SUM	Total of observations for specified months
KS	Kansas data
NE	Nebraska data
OK	Oklahoma data
HI	High density data
LO	Low density data
MTHS	Data consist of sequential monthly observations

APPENDIX 1

APPENDIX 1

The user needs to have the following files on his disk area:

EXEC files

REFORMAT
SPLIT
DISPLAY
EDITKSOK
EDITNE
MERGEKS
MERGEOK
MERGENE
LIST
SCALE
ANALYZE

Control (parameter) files

PARAMHI DATA
PARAMLO DATA
EDITMAR DATA
EDITMAY DATA
EDITJUN DATA
EDITSEAS DATA
EDITAPR DATA
EDITEMP DATA
EDITOCT DATA
EVAP DATA
EVAPKSOK DATA
EVAPNE DATA
DIFF DATA
MAR DATA
MAY DATA
MAYKS DATA
MAYNE DATA
MAYOK DATA
JUNE DATA
JUNEKS DATA
JUNEB DATA
JUNOK DATA
SEASON DATA
OCTOBER DATA
RATIO DATA
LIST DATA
SCALENE DATA
SCALEKS DATA
SCALEOK DATA
MULTY DATA

Data Files

REFER DATA
LASREC DATA
KSOA DATA
NEOA DATA
OKOA DATA
KSYLD DATA
NEYLD DATA
OKYLD DATA
KSCORE DATA
NECORE DATA
OKCORE DATA

APPENDIX 2

APPENDIX 2

The following TEXT files are required for program execution

AMEAN
CONVRT
CUMLA
CURVE
DASEQ
DECOMP
DGENOP
DLINOP
DREADB
DREADF
DWRITF
EDITA
EDITC
EDITF
FETCH
GENOP
LINOP
MADIR
MATINV
MINOP
MULREG
NADEC
NUNIT
READA
READB
READF
READM
READT
READV
RESEQ
ROSCA
ROVEC
SCALE
SEQOP
SINTER
TRANL
TRANO
TRANOR
TRANU
TRANUT
WRITA
WRITB
WRITF

APPENDIX 3

APPENDIX 3

```
>DISPLAY EXEC CONTROL FILES ...
>TYPE PARAMHI DATA

                                    HIGH DENSITY DATA
    2    2    3    1    2    2
GLOBAL                   0    0    1    2    2    2  0.0
LAST

R; T=0.02/0.21 10:38:59

>TYPE PARAMLO DATA

                                    LOW DENSITY DATA
    2    2    3    1    2    2
GLOBAL                   0    0    1    2    2    2  0.0
LAST

R; T=0.03/0.39 10:39:42

>
```

EDITKSOK and EDITNE EXEC control files ...

```
TYPE EDITMAR DATA

                    MARCH PRECIPITATION - OKLAHOMA HIGH DENSITY DATA
    1    1    1
OK  HI              R MM    3    0    0    0    2    2    2
LAST

R; T=0.02/0.05 19:02:10

>TYPE EDITMAY DATA

                      MAY PRECIPITATION - OKLAHOMA HIGH DENSITY DATA
    1    1    1
OK  HI              R MM    5    0    0    0    2    2    2
LAST

R; T=0.02/0.05 19:02:25

>TYPE EDITJUN DATA

                     JUNE PRECIPITATION - NEBRASKA HIGH DENSITY DATA
    1    1    1
NE  HI              R MM    6    0    0    0    2    2    2
LAST

R; T=0.02/0.05 19:02:38
```

```
>TYPE EDITFEB DATA

                AUGUST - FEBRUARY PRECIPITATION - NEBRASKA HIGH DENSITY DATA
    2    2    1    1    2
NE  HI .          P MM    0    0    8    7 WET A-F
LAST

P: T=0.02/0.05 19:02:52

>TYPE EDITAPR DATA

                  APRIL PRECIPITATION - NEBRASKA HIGH DENSITY DATA
    1    1    1
NE  HI            P MM    4    0    0    0    2    2    2
LAST

P: T=0.02/0.05 19:03:05

>TYPE EDITEMP DATA

                    MAY TEMPERATURE - NEBRASKA HIGH DENSITY DATA
    1    1    1
NE  HI            T C     5    0    0    0    2    2    2
LAST

P: T=0.02/0.05 19:03:18

>TYPE EDITOCT DATA

                  OCTOBER PRECIPITATION - NEBRASKA HIGH DENSITY DATA
    1    1    1
NE  HI            P MM   10    0    0    0    2    2    2
LAST

P: T=0.02/0.05 19:03:31

>
```

MERGEKS, MERGEOK and MERGENE EXEC control files ...

```
TYPE EVAP DATA

          APRIL POTENTIAL EVAPOTRANSPIRATION - NEBRASKA HIGH DENSITY DATA
    3    1    1
NE  HI            T C     4 1955 1967    0    1    2    2
LAST

P: T=0.02/0.05 19:03:48
```

```
>TYPE EVAPKSDP DATA

        MARCH POTENTIAL EVAPOTRANSPIRATION - KANSAS HIGH DENSITY DATA
    3     1     1
KS  HI              T C      3 1955 1967     0     1     2     2
LAST

R; T=0.02/0.05 19:04:08

>TYPE EVAPNE DATA

        APRIL POTENTIAL EVAPOTRANSPIRATION - NEBRASKA HIGH DENSITY DATA
    3     1     1
NE  HI              T C      4 1955 1967     0     1     2     2
LAST

R; T=0.02/0.05 19:04:22

>TYPE DIFF DATA

           MARCH PRECIP - MARCH POT EVTRN - KANSAS HIGH DENSITY DATA
 P-E      2     1     2     2     1     2     1     2  100
GLOBAL.                 1955 1967
LAST

R; T=0.02/0.05 19:04:35

>TYPE MAR DATA

        DFN AND DFN SQUARED - MARCH DIFFERENCES - KANSAS HIGH DENSITY DAT
A
    2     2     2
GLOBAL                    0 1955 1967     0     2     1     2
LAST

R; T=0.02/0.05 19:04:51

>TYPE MAY DATA

                DFN - MAY TEMPERATURE - NEBRASKA HIGH DENSITY DATA
    2     2     2
GLOBAL                    0 1955 1967     0     2     1     1
LAST

R; T=0.02/0.05 19:05:14

>TYPE MAYKS DATA

          DFN SQUARED - MAY PRECIPITATION - KANSAS HIGH DENSITY DATA
    2     2     2
GLOBAL                    0 1955 1967     0     2     1     3
LAST

R; T=0.02/0.05 19:05:30
```

```
>TYPE MAYOK DATA

      DFN AND DFN SQUARED - MAY PRECIPITATION - OKLAHOMA HIGH DENSITY DA
TA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    2
LAST

R: T=0.02/0.05 19:05:47

>TYPE MAYNE DATA

               DFN - MAY TEMPERATURE - NEBRASKA HIGH DENSITY DATA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    1
LAST

R: T=0.02/0.05 19:06:01

>TYPE JUNE DATA

      DFN AND DFN SQUARED - JUNE PRECIPITATION - NEBRASKA HIGH DENSITY D
ATA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    2
LAST

R: T=0.02/0.05 19:06:14

>TYPE JUNEKS DATA

      DFN AND DFN SQUARED - JUNE PRECIPITATION - KANSAS HIGH DENSITY DAT
A
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    2
LAST

R: T=0.02/0.05 19:06:31

>TYPE JUNOK DATA

               DFN - JUNE PRECIPITATION - OKLAHOMA HIGH DENSITY DATA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    1
LAST

R: T=0.02/0.05 19:06:44

>TYPE JUNEB DATA

      DFN AND DFN SQUARED - JUNE PRECIPITATION - NEBRASKA HIGH DENSITY D
ATA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    2
LAST

R: T=0.02/0.05 19:06:58
```

```
>TYPE SEASON DATA

       DFN - AUGUST TO FEBRUARY PRECIPITATION - OKLAHOMA HIGH DENSITY DA
TA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    1
LAST

R; T=0.02/0.05 19:07:11

>TYPE RATIO DATA

           APRIL PRECIP/APRIL POT EVTRN - NEBRASKA HIGH DENSITY DATA
 P/E     2    1    2    2    2    2    1    2  200
GLOBAL                 1955 1967
LAST

R; T=0.02/0.05 19:07:24

>TYPE OCTOBER DATA

            DFN - OCTOBER PRECIPITATION - NEBRASKA HIGH DENSITY DATA
    2    2    2
GLOBAL                    0 1955 1967    0    2    1    1
LAST

R; T=0.02/0.05 19:07:39

>
```

LIST EXEC control file ...

```
TYPE LIST DATA

                     EDITED DATA - DFN AND DFN SQUARED FILES
    2    2    2
GLOBAL                    0    0    0    0    2    2    2
LAST

R; T=0.02/0.05 19:07:59
```

>

SCALE EXEC control files...

```
TYPE SCALE DATA

        SCALED EDITED DATA - NEBRASKA HIGH DENSITY DFN AND DFN SQUARED FI
LES
     2     1     1                                                  ← Scaling parameters
NE   HI         APR P/E      0     0     0     0     2     2     2
NE   HI    DFN MAY T C       0     0     0     0     2     2     2
NE   HI    DFN JUN R MM      0     0     0     1     2     2     2
NE   HI    DFN2JUN R MM      0     0     0     2     2     2     2
NE   HI    DFN OCT R MM      0     0     0     0     2     2     2
LAST                                                  ← 0 = 10^0   3 = 10^-3
                                                        1 = 10^-1  4 = 10^-4
R; T=0.03/0.08 19:08:23                                 2 = 10^-2.

>TYPE SCALEKS DATA

        SCALED EDITED DATA - KANSAS HIGH DENSITY DFN AND DFN SQUARED FILE
S
     2     1     1
KS   HI    DFN MAR P-E       0     0     0     0     2     2     2
KS   HI    DFN2MAR P-E       0     0     0     0     2     2     2
KS   HI    DFN2MAY R MM      0     0     0     0     2     2     2
KS   HI    DFN JUN R MM      0     0     0     0     2     2     2
KS   HI    DFN2JUN R MM      0     0     0     0     2     2     2
KS   HI    DFN A-F R MM      0     0     0     0     2     2     2
LAST

R; T=0.03/0.08 19:08:48

>TYPE SCALEOK DATA

      SCALED EDITED DATA - OKLAHOMA HIGH DENSITY DFN AND DFN SQUARED FILE
S
     2     1     1
OK   HI    DFN MAR P-E       0     0     0     0     2     2     2
OK   HI    DFN2MAR P-E       0     0     0     0     2     2     2
OK   HI    DFN MAY R MM      0     0     0     0     2     2     2
OK   HI    DFN2MAY R MM      0     0     0     0     2     2     2
OK   HI    DFN JUN R MM      0     0     0     0     2     2     2
OK   HI    DFN A-F R MM      0     0     0     0     2     2     2
LAST

R; T=0.03/0.08 19:09:13
```

```
>TY SCHLEMF DATA

        SCALED EDITED DATA - NEBRASKA HIGH DENSITY DFN AND DFN SQUARED FI
LES
     2     1     1
NE   HI         APR P/E       0     0     0     0     2     2     2
NE   HI    DFN  MAY T C       0     0     0     0     2     2     2
NE   HI    DFN  JUN P MM      0     0     0     0     2     2     2
NE   HI    DFNS JUN P MM      0     0     0     0     2     2     2
NE   HI    DFN  OCT P MM      0     0     0     0     2     2     2
LAST

R; T=0.03/0.08 19:09:36

>
```

ANALYZE EXEC control file ...

```
TYPE MULTY DATA

 PREDICTION FROM NEBRASKA HIGH DENSITY DATA, 12 YEARS COMMENCING 1955, F
OR 1967
     2     (9)    2     2     2     1 0.05
GLOBAL                   1955 1967
LAST

R; T=0.02/0.05 19:09:53

>
```

10' required for Kansas and Oklahoma analyses

```
LOGOFF
CONNECT= 00:38:22 VIRTCPU= 000:09.61 TOTCPU= 000:18.62
LOGOFF AT 19:10:14 EST MONDAY 10/09/78
D
```